

Fournier (Alfred)

# SYPHILITIC TEETH.

FROM THE FRENCH OF

## ALFRED FOURNIER.

PROFESSEUR À LA FACULTÉ DE MÉDECINE DE PARIS, MÉDECIN DE L'HÔPITAL  
ST. LOUIS, ETC.

TRANSLATED FOR THE DENTAL COSMOS.

BY

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VENEREAL DISEASES IN THE UNIVERSITY OF PENNSYLVANIA, ETC.

*presented by the author*

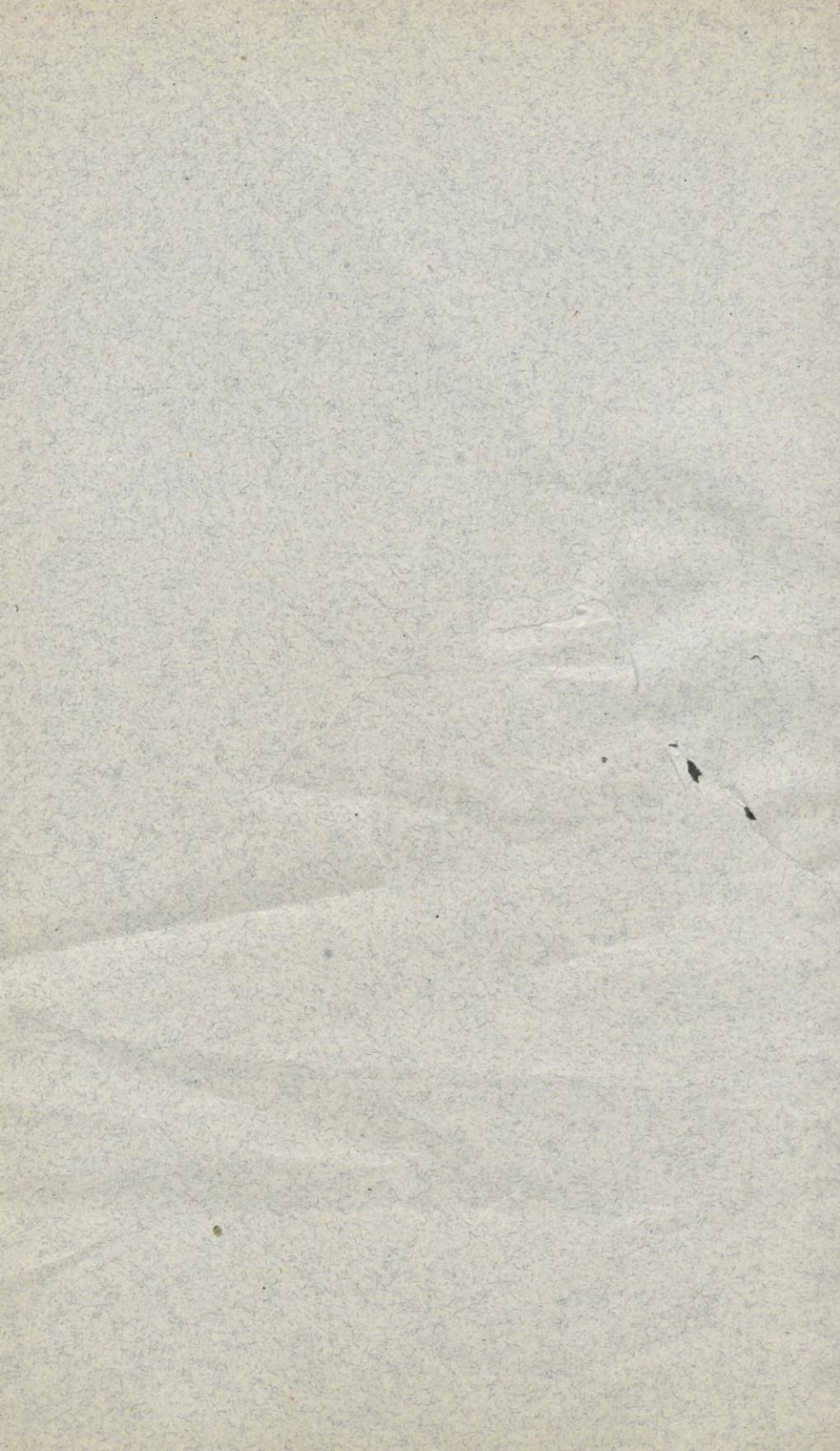
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PHILADELPHIA:

THE S. S. WHITE DENTAL MANUFACTURING CO.

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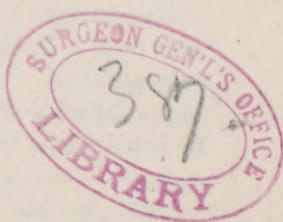
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## SYPHILITIC TEETH.\*

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THE hereditary influence of syphilis frequently, though not invariably, affects the dental organs, and manifests itself in diverse lesions. Although all the subjects of hereditary syphilis do not present the dental malformations which we are about to describe, there are nevertheless enormous numbers in whom these lesions will be met with.† An examination of the dental organs, therefore, constitutes an important element in the retrospective diagnosis of hereditary syphilis.

Cases where hereditary syphilis has been suspected, but has only been recognized through indications primarily furnished by the state of the teeth, need not be cited, being so numerous and so familiar. In many instances hereditary syphilis has, to the great benefit of the patients, been diagnosed solely through these unique dental malformations.

An illustrative case occurred in the practice of Paget: A young girl was afflicted with a serious lesion of the nose, which had been pronounced lupus, and had been treated as such. Paget, in examining this patient, was astonished to find dental malformations of a kind that are usually concomitant with hereditary syphilis. Nothing else that would lead to the supposition that she was affected with syphilis was found. Nevertheless, for this reason alone it was decided to

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\* From *Annales de Dermatologie et de Syphiligraphie*, Sept. and Oct., 1883.

† It is as yet impossible, I believe, to determine by reliable statistics the frequency of these lesions in hereditary syphilis. I have tried to establish a record of this kind, but was compelled to give it up for the time being for the reason that in a great number of recorded observations upon late hereditary syphilis, no mention of the condition of the teeth is made. The absence of information on this point, however, does not prove that the teeth did not exhibit abnormalities, but merely suggests that no attention had been paid to this peculiarity.

use anti-syphilitic treatment. The supposed lupus was cured in six weeks.\*

The interest which attaches to the subject of the influence of syphilis upon the teeth, and the agitation in scientific circles to which it has lately given rise, are sufficient reasons for the discussion upon which I will enter without further introduction.

The hereditary influence of syphilis shows itself in the dental system in two ways, very unequal in point of diagnostic value, viz.: First, by a retardation of evolution; second, by the arrest of growth and by modifications of structure.

A few words will suffice for the consideration of the first. The hereditary influence of syphilis causes occasionally a retardation more or less marked in dental evolution. This is a peculiarity which has been recognized for a long time. So long ago as the last century Sanchez called attention to the tardy dentition of infants born with syphilis. The same fact has been noticed since then by a number of authors, notably in our time by a most competent specialist, Dr. Magitot. I have in my note-book several cases of syphilitic children who have not begun to "cut their first teeth" before ten, twelve, fourteen, or fifteen months. This retardation of evolution applies generally to the entire denture. It has been noticed, however, to be limited, in some cases, to one group of teeth—the incisors, for example. We find it especially in the first dentition, in the reports which I have been able to consult on this subject. Some cases show that a similar retardation occurs in the eruption of the permanent teeth.

This retardation of evolution is in some instances very marked. Demarquay relates the case of a syphilitic child who, at the age of four years, had not a single tooth, and who (a most curious and most significant peculiarity from a pathogenic stand-point) could not yet walk. M. Lancereaux has likewise described a "true arrest of development of dentition," in the case of a syphilitic child, who was at the same time microcephalic, idiotic, and epileptic. At the age of twelve years the lateral incisors and the cuspids hardly extended beyond their alveoli.†

This retardation of dental evolution is but a localized expression of a more general fact—viz., the retardation of development among persons affected with hereditary syphilis. The evolution of the individual—that which is commonly called the *growth*—occurs but slowly and in an imperfect manner, in the cases of syphilitic children. The dental system participates in this disposition of the whole being,—a fact curious in itself and even possessing some interest in

\* See *Medical Times and Gazette*, 1862, No. I. p. 309.

† *Traité de la syphilis*, 2d edit., p. 442.

the way of retrospective information; but it could not carry much weight in diagnosis.

Inherited syphilis implies numerous other troubles in the constitution of the dental organs which afford us more valuable means of diagnosis. For convenience of study and facility of remembrance, they may be divided into four principal groups: First, dental erosions; second, microdontism,—the reduction below the physiological average of the volume of certain teeth; third, dental amorphism—that is, certain teeth lose more or less the attributes of their proper class or type; fourth, vulnerability, the dental organs being more readily acted upon by the causes of attrition and disorganization—in other words, rapid wear, ready change, and early decay of certain teeth. Add to these four principal groups some peculiarities of a rarer kind (such as, for example, irregularities of alignment, anomalies of reciprocal arrangement, etc.), and you will have very nearly the complete programme which offers itself for our study.

It is to teeth affected in one or other of the preceding ways that the name "syphilitic teeth" is given—an incorrect term, but one sanctioned by usage. One might think that, in imitation of what is called the syphilitic testicle, the syphilitic liver or kidney, the "syphilitic tooth" should be a tooth which, having been normally constituted, had been affected later by syphilis; but what is meant by this term "syphilitic tooth," is a congenital dental malformation, originating from syphilitic influence, a deficiency of development stamped by syphilis on a tooth yet unformed, and during what constitutes, if I may so speak, its fetal life: in other words, the consequence of the pathological action exercised by syphilis upon it during its *intra-follicular* development.

A few words upon the history of the subject, before taking up the special descriptions. It was in England that the study of the influence of syphilis upon the teeth first arose, and it is to Hutchinson that the credit of originating it is due. It is in England, also, that the question has been most discussed and is most generally known. It has given rise there to a truly scientific agitation, which quickly popularized it. Among English writers these syphilitic teeth, "typical teeth," are recognized as an element in the diagnosis of hereditary syphilis. In France, on the contrary, we must acknowledge that the subject is as yet little known. Despite the remarkable works of Prof. Parrot, of Dr. Magitot, and of some of the latter's students, investigation has extended very little beyond a limited circle of practitioners more especially devoted to syphilitic diseases or to the dental art. It has not reached the general medical public, and at present we know very little of the clinical value which an examination of the teeth may possess in the diagnosis of hereditary syphilis.

Let us establish a few general propositions :

First, hereditary syphilis can influence both dentitions. At first it was thought, with Hutchinson, that the second dentition alone was susceptible to this influence ; but it has since been recognized that the first dentition may be affected as well as the second. M. Parrot has furnished incontestable proofs on this point. In a fine specimen which he has kindly placed at my disposal,\*—the dentition of a heredo-syphilitic infant aged twenty-seven months,—the two superior central incisors are strongly notched crescently and present the most characteristic type of that which is at present described under the name of the “Hutchinson tooth.”

Second, the first dentition appears to be very much less often influenced by hereditary syphilis than the permanent dentition. Where we find one case of first dentition affected we find fifteen or twenty of the second. I should state, however, that this proportion would be perceptibly modified if we took the precaution, in all autopsies of young children, to open the alveoli in order to examine the embryonic teeth. M. Parrot recently told me that in doing so he had often discovered lesions of the milk-teeth.

Third, the dental malformations occasioned by hereditary syphilis are commonly multiple and symmetrical—that is to say, we find several teeth affected, as a rule, and usually the corresponding teeth are similarly affected. If in an upper jaw the left central incisor is affected, the same condition will exist in the right central incisor. If one lower cuspid is affected, the other will present an alteration of the same nature. Such is the rule, though it is not absolute, but has its exceptions. There are cases where these malformations affect certain teeth only unsymmetrically ; also where only one tooth is found to be affected. These are the unusual exceptions, overlooked for a time, but which have brought about a more careful study of the question.

These generalities established, let us now take up the particular descriptions.

**DENTAL EROSION.**—It sometimes happens that, in the description of a disease, one symptom or one lesion receives attention to the exclusion of others which are no whit less important or interesting, or which are even more important in clinical significance. As an example, dental erosion is but a part of a whole, and yet to read what has been written on the subject, to listen to the talk about it, one would think that all dental syphilis consisted in erosion,—an error against which it is necessary to protest at once. That which is called dental erosion is but one of a number of lesions—but one of

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\* Cast No. 48 from collection of Prof. Parrot.

the forms by which hereditary syphilis shows itself on the teeth, and perhaps, from the point which especially interests us, not the most important or significant. Under the common but incorrect name of "dental erosion" are designated diverse dental malformations, produced during the intra-follicular life of the tooth, and consisting in a peculiar alteration of the crown, which appears worn, corroded, worm-eaten, or *honeycombed* on a certain portion of its surface. One would say on seeing a tooth affected in this way that it had been cut into by an instrument or corroded by an acid. It resembles in appearance worm-eaten wood, and it is this appearance which gives it the name of erosion; but this lesion is not an erosion in the strict sense of the word.

Erosion conveys the idea of the wearing of a surface which has been previously normal; but that which is called dental erosion does not concern a tooth which, originally normal, has undergone later a corrosive action, but is the result of an imperfect formation of the tooth, the consequence of a temporary stoppage in its development. Before it issued from the gums it was the same as we see it ten, twenty, thirty years later, with such modifications only as time and functional use have impressed upon it. Such is the primordial idea which it is necessary to form concerning erosion in order not to mistake it—a common error—for the result of different pathological actions.

Let us consider the physical characteristics of erosion presented clinically under manifold and diverse forms. An indefinite number of varieties could be made if all the different forms were taken into consideration, but these are reducible to a certain number of principal types, to which the secondary forms are subordinate. Simplified in this way, the description of them becomes easier.

The different forms of dental erosion can be divided into natural groups, according as they affect the face or the free edge or grinding surface of the tooth. The first group consists of erosions affecting the face of the tooth. Several types offer themselves here. It will be necessary to recognize at least four, viz.: First, erosions "*en cupule*" (in little cups); second, erosions "*en facettes*" (in facets); third, erosions "*en sillon*" (in grooves or furrows); fourth, erosions "*en nappe*" (on the surface). Let us as briefly as possible examine into each of these varieties.

First, *erosion en cupule* (in little cups), the most simple of all the varieties and one of the most common, consists in small excavations or cups in the surface of the crown. To speak merely of the extreme types, between which are found all the intermediate ones possible, we find these cups now very small and punctiform, comparable to the slight depression which would be left by the point of a

pin in soft wax; now larger, and at the same time deeper, consisting of a true excavation, rounded, concave, and analogous in appearance to the impression of the *head* of a pin in wax. The erosions *en cupule* are always very easily distinguished. They force themselves upon the observer by a double characteristic: First, by irregularity of surface, the excavations of which strike the eye. Second, by characteristic color. Except in the very young, where they are still white, they contrast with the normal color of the tooth by a darker tint, grayish or of a dirty gray; sometimes even brownish, indeed, almost black. When we study them carefully, or, better still, when we have the opportunity to submit teeth thus affected to a microscopical examination, we recognize that the lesion consists of a depression more or less deep in the dental substance. If the cupule is superficial, its bottom is still covered with a thin layer of enamel. But if it is deeper, the enamel is wanting, and the bottom of the cavity is hollowed out of the substance of the dentine. These cup-like erosions affect all the teeth. But they are more common on the incisors—notably the superior centrals. They vary in number; we may find one or many on one tooth. When several exist, they may be scattered without order, but more commonly they are arranged in a row on a horizontal line. They may be seen (but this is a very rare exception) forming two horizontal lines, one above the other.

Second, *erosion en facettes* (in facets) is a form not so common. Like the preceding, it may be met with in the different teeth, but it affects especially the incisors. Suppose that one had filed flat and at several points the anterior surface of an incisor; this surface, in place of its normal curve, would present a series of small planes, forming what we term facets. Such is about the appearance of the dental malformation in question. The tooth eroded in facets presents a surface with irregularities such as would be produced by a file or cut with a plane. One would imagine it had sealed off in places, as if a fragment had been broken from it. At first this lesion may escape observation, as it most frequently does, which accounts for the slight notice taken of it up to the present time. It can be thoroughly examined only with the aid of a magnifying-glass, first taking the precaution to dry the tooth. Without this precaution the brightness of the moist enamel often renders inappreciable the extremely superficial irregularities of the dental surface.

Third, *erosion en sillon* (in grooves or furrows), a variety designated by M. Parrot as the furrowed-like or sulciform dental atrophy, is the most common form, and consists of a linear excavation in the crown of the tooth in the shape of a transverse groove. This groove is sometimes continuous, in which case it makes the entire circuit of

the tooth, like a ring; and it is often interrupted,—that is to say, formed of segments or sections which separate the healthy portions. It may even consist of a finely punctated line. That which is most important to specify is, that the groove presents itself in two forms. In the first it is linear and superficial—that is to say, it consists simply of a streak traced on the tooth much like the mark left by a pen on paper, or the groove produced by the passage of the point of a penknife on a piece of wood. The sight distinguishes this streak without conveying the idea of a depression, but the finger-nail placed on the tooth recognizes a slight furrow. In the second form we have to do with a regular *gutter*, deeper and wider than the preceding—a true furrow in the substance of the tooth, from half a millimeter to a millimeter or more in depth. One would say that the tooth had been filed, scratched, or scraped with an instrument, or corroded by an acid. The layer of enamel is partly gone, and it may so happen that the denuded dentine forms the bottom of the furrow.\* Of these two forms, the first is not easily seen without attentive examination; the second produces an unsightly deformity, which strikes the eye at first sight, because the furrow soon acquires a dark tint which contrasts strongly with the white color of the neighboring surface. No matter to which variety it belongs, the furrow preserves one unchangeable characteristic, namely, a rigorously *horizontal* direction, the cause of which we shall understand in studying the pathogeny of the lesion. Commonly *erosion en sillon* consists of a single furrow, presenting the characteristics I have just described. But there are instances of a different kind, where, in place of a single furrow, we find two or three on the same tooth. These multiple furrows occupy the portion of the crown nearest to the free edge of the tooth. They are placed one above the other horizontally, like parallel lines, and are separated from one another by a band of enamel which forms a slight border between them. It was to teeth affected in this manner that long ago the significant names of "stair-like teeth," "step-like teeth," were given. Finally, let us remark that in such teeth the free extremity, which constitutes the last step, is generally worn thin, partially or totally deprived of enamel, and is rough, uneven, irregular, and brownish. It crumbles and wears rapidly, so that even in youth, or later in adult life, the tooth is shortened and deprived of its free extremity, as if it had been filed horizontally. These different varieties of erosion may affect all classes of teeth, but they are most frequently found on the incisors.

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\* It may be remarked that, even at the level of the edges of the furrow, the layer of enamel sometimes causes a slight relief, in the form of a collar. This relief increases by so much the apparent depth of the furrow.

Fourth, *erosion en nappe* (surface erosion) is a rare form. It consists simply of an exaggerated form of the preceding ones. Imagine one of the erosions we have just described, increased in every way, tending to cover a large surface of the crown, and you will have the present type. The tooth affected in this manner is absolutely altered in appearance. It presents a wide, unequal, and rough zone, filled with alternating points and sinuosities, and is of a dirty yellow or blackish gray color. Still more magnify this pathological condition in extent of the lesions; imagine it general—that is to say, affecting the entire surface of the tooth—and you will then realize the monstrous type of tooth produced—completely disorganized and unrecognizable as a tooth. This is what Tomes has termed the honeycombed tooth; without doubt on account of the numerous anfractuosities presented, and which have been compared to the alveoli of a honeycomb.

A second group of the so-called surface erosions affects the free edge of the tooth. The malformations which compose this group present themselves under absolutely different forms, according as they affect different classes of teeth. It is necessary, then, to examine them separately on the molars, the cuspids, and the incisors.

Let us begin with the molars. An essential point should first be specified. In the class of molars there is but one tooth on which the influence of hereditary syphilis shows itself, and that is the first molar. We will confine ourselves at present to the mere statement, the explanation of which will occupy us later on. Here the malformation consists in a true atrophy of the cusps of the tooth (the “cuspidian atrophy” of Parrot). The body of the tooth for two-thirds or three-fourths of its height, is in a normal condition; but its upper segment, on the contrary, is lessened in all of its diameters—atrophied, eaten, as it were; separated by a circular furrow, as though it were set in it. At first sight one would say it was a smaller tooth growing out of a larger one, or better still, “a stump of dentine emerging from a normal crown” (Magitot). If we examine it more closely, we notice that the masticating surface of the tooth, instead of being neatly divided into a series of tubercles or cusps separating the undulated depressions, presents an irregular appearance, bristling with roughened elevations, granular or acuminate, filled with sinuosities, more or less deep, some of which penetrate to the dentine. Furthermore, this surface, in place of the pearl-like color which distinguishes the normal tooth, has a dirty yellow or brown tint. This appearance is that of the lesion as observed in infancy. But in time it is entirely transformed. Under the influence of mastication the grinding surface, abnormally constituted and partially deprived of enamel, wears away, and there remains a tooth doubly remarkable. First, because

it is notably shortened; second, because it ends in an absolutely flat surface—a true *plateau*, with a yellowish centre and a peripheral border of white enamel. This short and flat tooth has a diagnostic significance of the highest value.

Upon the cuspids, the erosion of the free edge shows itself in one or other of the two following varieties: First, as a simple notch of the cusp in a V-shaped form, similar to the cut made in a piece of wood by two convergent strokes of a knife; second, as a true atrophy of the free edge, which undergoes a marked circular cutting-out, and is reduced to a slender conical stump, which appears as if set in the body of the tooth, or as if "hafted in a cylindrical ferrule" (Parrot).

In the case of the incisors, the varieties are more numerous. It is necessary to recognize at least five. A few words will suffice to describe them. The first consists of an angular notch, identical to that which I have just described to you in relation to the cuspids. It is a cut, more or less irregular, into the free border of the tooth. The second consists in the notching of the free edge, which is formed of a series of small pointed projections, separated one from the other by a corresponding number of depressions. This is what is termed "saw-like" teeth. The third is characterized by atrophic thinning of the free edge, with antero-posterior flattening. Imagine a wax tooth to have been compressed and flattened at its free extremity by the jaws of a pair of pincers, and you will have the exact representation of this variety. The cutting edge of the tooth affected in this manner is diminished in thickness—flattened from before backwards; sometimes even reduced to a simple plate. It is, furthermore, unequal, irregular, rough, filled with transverse or vertical depressions. Its color is changed,—yellow or gray, indeed nearly black in some places. In some cases the thinning of the cutting edge becomes excessive. In a case of M. Lailler's, the free edge of a superior incisor was reduced to the thickness of two millimetres, in the condition of a simple scale of extreme thinness, to be compared to a thick sheet of paper. It is needless to say that a tooth affected in this manner is weak, friable, and easily worn or broken. At other times, the appearance of the lesion is somewhat modified. The cutting edge of the tooth is not only thin,—it is irregular, as if folded, covered with vertical furrows. In a case recently observed the two upper central incisors were as if wrinkled at the free edge, being thin, sinuous, and divided at half their height by quite a deep furrow. The fourth form reproduces the general atrophy of the free edge which I have described in reference to the cuspids and molars. The tooth offers a normal base but is suddenly constricted within a few millimetres of its free edge by a circular furrow, from which

emerges a small rough stump, with an uneven surface and of a dirty color,—gray or yellow.

Fifth, and finally, we come to a special type, about which there has been much discussion during the past two years. I speak of the erosion with the semi-lunar notch; also called crescent-shaped, or crescentic notch. It is that which more recently has been called "Hutchinson's tooth"—truly a legitimate name, since Hutchinson has the merit of having first described this dental malformation and recognized its pathological significance. A full description of this tooth is necessary, because of its importance.

The lesion designated under the name of "Hutchinson's tooth" consists in one important characteristic, to which may or may not be added different accessory ones. The important characteristic consists of a semi-circular cut in the free edge of the tooth. This cut is well marked in the typical form of the lesion. It encroaches upon the free edge of the tooth, following a curved line, regularly and almost gracefully arched, the convexity of which is towards the neck of the tooth, in such a manner that this free edge forms a crescent. The superior central incisors are the seat of preference *par excellence* for this crescentic notch, which by its shape and seat offers itself as a special lesion, having its own individuality. There is no other dental lesion which can be compared to it. Likewise, from a purely clinical point of view, it has its own peculiar features, which exclude all risk of confusion. It asserts itself, one might say, at first sight. It is impossible to mistake it, or seriously to consider it in connection with any other affection of the dental organs. That which objectively resembles it most is the wearing away of the dental substance caused by a pipe-stem. This also assumes a crescentic shape; but the wearing away caused by the pipe is slight except in the space between two teeth, and not on a single tooth; it is never observed on the central incisors, for the good reason that a pipe is held to one side and not in front; it is never so regular as the notch of Hutchinson, which has its centre of curve corresponding in a mathematical manner to the axis of the tooth, etc. A tooth accidentally broken would not be mistaken for a "Hutchinson tooth," for a fracture is irregular and never assumes a crescentic shape.

The crescentic notch is the essential characteristic of the Hutchinson tooth; but it is not the exclusive one. There is frequently added one or other of the following peculiarities, which all, in different degrees, are worthy of attention. The dental notch is nearly always beveled at the expense of its anterior edge. In other words, the anterior border of the crescentic arch is cut obliquely from above downwards, and from before backwards, as if a chip had been detached from this edge by a cutting instrument,—an insignificant

detail apparently, but really an important one, whose special interest we will notice later. The Hutchinson tooth is oftenest noticeable by its rounded angles. In the normal condition the lateral borders of an upper central incisor form with its inferior edge very sharp angles. Here, on the contrary, there is no angle, no sharp edge; the sides unite with the inferior border by a curved line. Often the Hutchinson tooth is very much reduced in length. This characteristic of shortness is very striking in some patients. Sometimes, also, it is a narrow tooth having a transverse diameter below the average. You are aware that the normal characteristic of the upper central incisors is a greater transverse diameter than that of the laterals. In the Hutchinson type of tooth it sometimes happens that they are not so wide as the latter. It is not uncommon,—and this is a point upon which the English writers have particularly insisted,—for the Hutchinson tooth to take upon itself the so-called "screw-driver" shape—that is to say, to show itself broader on a level with its neck than at its free edge. This configuration—the opposite of the normal shape—recalls very accurately the shape of that well-known tool, the screw-driver. Finally, the upper central incisors having the Hutchinson notch also deviate frequently from normality in direction, and in place of having their vertical axes parallel, they are inclined toward each other—obliquely convergent.

The features which I have just described constitute the perfect type of the Hutchinson tooth, and are best observed in youth. But this type is far from being unchangeable. It offers, to begin with, differences of degree—that is to say, it is more or less marked, according to the case. Moreover, it presents modifications at different ages; and this is of the greatest importance, as we shall see. In the first place, the Hutchinson tooth does not protrude from the gum with the clearly-cut notch which I have previously described. At the beginning this notch presents itself, either filled, or in part occupied, with small, apparently atrophied vegetations of the dental tissue. The curve of the arch bristles with these productions, in the form of little spines—serrations—resembling the teeth of a fine saw. Sometimes a larger lobule in the form of a truncated cone will be observed at the top of the curve. These are merely the remains left by the atrophic process which the tooth has undergone at the time of its formation. Deprived of enamel, non-resisting, friable, they become blunted, wear away, break off, and are very rapidly destroyed; so that after a few years they completely disappear, leaving in their place the smooth crescentic notch.

A point of true practical interest is that the Hutchinson tooth is changed in form after adolescence, and ends by losing its characteristic notch. Under the influence of functional employment the arch

of the free border—the depth of the notch—progressively diminishes or shortens. A time arrives when the curve of this vault is scarcely perceptible. Finally, all trace of the notch disappears, and the free edge is transformed into almost a straight line. Let us be precise. From the age of twenty to twenty-two years the vault is notably diminished. At twenty-five years it becomes nearly flat. But at this time there still remains, at least for a while, a particular sign which enables us to recognize the lesion. It is the bevel of the anterior edge of the tooth. Remember that the Hutchinson notch is cut from above downwards and from before backwards, at the expense of its anterior border. This bevel is naturally not affected by the general wearing of the tooth until the last; so that it remains still easily recognizable when the notch has disappeared. It thus constitutes a final vestige of that lesion. I saw to-day a fine specimen of this kind. The patient was born of syphilitic parents, and has been affected with the different symptoms of hereditary syphilis. She had certainly (her testimony on this point is very clear) her two superior central incisors strongly notched. But that disappeared with age, she affirmed; and now, having reached the age of twenty-five years, she presents but a faint vestige of this old lesion, in the form of a sharp bevel of the anterior edges.

Such is Hutchinson's tooth at the age of twenty-five years. Beyond this age the bevel in its turn disappears, and nothing remains of the primitive malformation, unless it is a shortened tooth, which has no further significance. So that it has been truly remarked that beyond the age of thirty years there is no such thing as Hutchinson's tooth. This dental malformation is marked not only on account of its shape, but also, and to an equivalent extent, by its location. Thus, first, in a manner which we may almost call constant, it has for its location the superior central incisors of the second dentition; second, it not less commonly affects the two teeth in precisely the same manner, symmetrically; third, it often happens that it affects them in an exclusive manner—that is to say, as a rule, the notched erosion is met with on the two central incisors, and the other teeth do not participate in this order of malformation, though perhaps exhibiting malformations of another kind. It is curious, for example, to meet alongside of notched central incisors the lateral incisors free from all notching.

Having determined the rule, we must make note of the exceptions. Each of the three propositions which I have just formulated has its exceptional cases, which we are compelled to mention. The Hutchinson notch is observed not only on the superior central incisors of the second dentition; it is met with on the same teeth of the deciduous set; it is seen sometimes in the second dentition on

teeth other than the central incisors, *viz.*, the upper lateral incisors, the inferior incisors, even (but rarely) the cuspids. It can affect in different degrees the two superior central incisors, or it may affect only one, the other remaining intact. Cases of this kind are very rare, to be sure, but Legros Clark, Hutchinson, and Moon have each cited well-authenticated examples. I have in my notes a similar case, where one of the central incisors was entirely normal while the other presented a perfect type of the crescentic notch.

Several classes of teeth can, at the same time with the central incisors, present the type of the crescentic notch. I have now a patient, son of a syphilitic mother, and affected with specific symptoms of congenital origin, who presents different malformations of the dental organs: among others well-marked notches, first, on the superior central incisors; second, on the two inferior central incisors; and third, on the cupid. Likewise, in the mouth of a young patient of 12 years, lately shown me by my colleague and friend, Dr. Besnier, there are recognizable very fine Hutchinson notches, upon the two superior central incisors, as usual, and also upon the four inferior incisors.

Such are the various forms of what is termed dental erosion. After having described them individually, it remains for me to add that they rarely present themselves in an isolated manner. Thus, nothing is more common than to recognize in the same subject dental erosions of different types on different teeth—here grooves, there depressions or facets, elsewhere angular notches or cuspidian atrophy. Two or three varieties of erosion tend to multiple combinations. The Hutchinson notch, which in this respect is an exception to the common rule, very often constitutes an exclusive lesion. There is nothing astonishing in the habitual coexistence of these different forms of dental erosion. They are in effect but varieties of one and the same lesion, and though they assume different objective appearances, they arise from one and the same morbid process. Thus, as has been forcibly said and demonstrated by M. Magitot, dental erosion is a uniform pathological condition, and the differences which it presents are but variations.

Dental erosions are now known to us so far as the lesions are concerned; but many essential peculiarities of their clinical and anatomical history remain to be noticed. A word or two on their habitual seat. They can affect both dentitions, but they are observed more frequently on the permanent than upon the temporary teeth. In the second dentition (which we have to consult particularly for special diagnostic signs), dental erosions are met with in the order of their frequency: First, on the first molars; second, on the incisors; third, on the cuspids. The first molars, especially

those of the lower jaw, are most frequently affected by the erosion.

To start with, therefore, we can establish the principle that, if any class of teeth is touched by the erosion, it is an exceptional case where the first molars remain intact ; and it is not rare that they alone are attacked, to the exclusion of other teeth. Inversely, there are dental groups which are almost invariably exempted by the erosion. These are the bicuspids and the second and third molars.

Note the following propositions: First, dental erosions are almost always multiple. At the least they affect two teeth ; much more frequently four, six, eight, ten ; sometimes twelve or sixteen. It is an extraordinary case to find but one tooth eroded. I have, however, a case of this kind in my practice. A young man, son of syphilitic parents, and syphilitic himself from birth, presents a first inferior molar affected with the most marked cuspidian atrophy, while the remainder of his teeth are entirely exempt from the slightest alteration.

Second, dental erosions are nearly always symmetrical—that is to say, they affect homologous teeth in a like manner. So that, for example, if the right lower cuspid has an erosion on its crown, there is every chance in favor of finding the same lesion on the left lower cuspid. To this law of symmetry there are but very few exceptions.

Third, erosions of corresponding teeth maintain the same level on the crown. That is to say, if an erosion is situated at a given height on the crown of a tooth on the left side, the corresponding tooth on the right side will present an erosion situated precisely at the same height on its crown. For example, let us imagine a lower central incisor of the left side presenting a transverse furrow at the union of the upper third with the middle third of its crown ; you will almost invariably find on the corresponding tooth of the right side an identical furrow situated at the same height. In the same way, suppose it to be an angular notch occupying the crown of a lower cuspid ; almost certainly the crown of the other cuspid will be the seat of a similar lesion, and so of any other variety of erosion.

Fourth, erosions are situated at different heights on teeth of different classes ; and these differences of level are in precise anatomical relation with the chronological differences of eruption of these different teeth. If we compare two eroded teeth of different kinds in reference to the level of the crown at which the erosion has taken place on each of them, we find that it is seated at different heights. Take, for example, a cuspid and a central incisor of the lower jaw. On the cuspid, the erosion will occupy the edge of the tooth ; on the incisor, it will be situated from one to two millimetres from the edge. The differences which intervene in the reciprocal

development of different classes of teeth correspond exactly with the differences of level in the erosion of these same teeth. The *cuspid* is later than the *incisor* in the beginning of development ; it commences to calcify later, and, at the time when its crown is only in the early stages of formation, the *incisor* already measures one or two millimetres of finished dentition. There is, therefore, a precise connection between the height of the erosion on the crown and the stage of dental development at a given time. These technical details are indispensable in order to properly interpret the pathogeny and the semiological value of the dental erosion.

A slight glance at the pathological anatomy will serve to complete the argument. If we make a vertical section of a tooth affected with erosion, we perceive at first, with the unaided eye or with the help of a magnifying glass, that the profile of the tooth offers one or many sinuosities, with roughened bases, irregular and blackish. These sinuosities are nothing more than the results of erosion, encroaching upon and excavating the dental substance to various depths. At times the lesion affects the enamel alone, of which a layer, thinned and changed, is found at the bottom of the cavity ; at others it penetrates to the dentine. On microscopic examination the enamel appears chipped off even with the edge of the lesion. Its tubes are broken at unequal heights, and their extremities form an irregular, roughened surface. They seem to have lost their reciprocal cohesion, and to be but imperfectly joined one to the other. Above and below the erosion the enamel assumes its normal condition. Up to this point there is nothing extraordinary, and nothing unexpected. But the condition of the dentine has a surprise in store for us. At the level of the erosion, and only at this level, the dentine is affected, the alteration following the track of a horizontal zone corresponding to the plane of the erosion. If there is but one erosion, we find but one band of dentine changed in this way ; but if there are several, as in the "step-like" teeth, we find an equal number of diseased zones of dentine, separated by zones of healthy dentine,—a topography certainly of the most curious and instructive kind, from a pathological stand-point, as we shall see later. Through the entire thickness of the zones corresponding to the erosions, the substance of the dentine is altered in a special manner. It would be going away from my subject to describe to you the anatomical details of this lesion. It will suffice for me to say that we there observe a form of degeneration of dental tissue characterized chiefly by an anomalous texture of the dentine, termed in special pathology globular transformation of the dentine. This lesion is well known to odontologists, and is considered by them to depend upon a vicious nutritive formation of the teeth.\* It is not a simple erosion of the

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\* *Vide Magitot,—op.cit.*

surface; anatomically, it is at the same time a superficial and a deep lesion—a lesion of the whole tooth.

From the preceding data we can form an idea of what dental erosion is, of its pathogeny, and of the mechanism of its production. A few general propositions in recapitulation will embody our conclusions on this subject. First, dental erosion is a lesion contemporary with the formation of the tooth. This is very plain, since the eroded tooth leaves its alveolus in an eroded state, and since we find it eroded in its alveolus when we take the trouble to look for it there. The erosion is the stigma of a lesion finished during the alveolar life of the teeth. Second, dental erosion is the consequence of an interruption occurring during the process of dentification at the time of the forming of the tooth. In a tooth thus affected, a portion of its substance is lacking, and this portion is lacking, not because it has been destroyed, but because it has not been formed. It is apparent that this interruption of formation was temporary, since above and below this unformed portion of the crown we find the tooth normal and regular. It is thus demonstrated that this stage of non-formation had but a short period of duration. A tooth is, let us suppose, in course of formation, and its summit is already covered with a solidified zone, which in technical language is called the dentinal cap. If things followed their habitual and normal course, this process would continue in the direction of the neck, and would end by forming a regular tooth. But a morbid element makes its appearance which disturbs the nutrition of the organ. Under this influence an insufficient quantity of nutritive materials is appropriated; the cells which should, by becoming incrusted with calcareous deposits, prolong the dentinal cap, undergo a sort of atrophy; calcification is suspended, or is accomplished in an improper or defective manner, and, as a consequence, a dental zone is imperfectly and incompletely formed *flatwise* on the crown. The erosion formed, the morbid element ceases to act, dental nutrition begins again, and the tooth again takes on normal growth. There always remains, however, between the two normal segments, the intermediary atrophied zone, in the state of an indelible, irreparable lesion.

Such is the process of erosion, and we may add to this pathogeny the few following corollaries: It is natural that the importance of dental erosions in regard to extent and depth should be in keeping with the intensity, the character, and the duration of the intervention of the morbid cause from which they proceed. If this cause is powerful, active, intense—if it is of long duration—the result will be an extensive erosion. If the cause is slight and of short duration, the erosion which results will be but superficial, and proportionately less. If the cause makes itself apparent at different

periods, with intermissions when its action is suspended, several successive erosions will be produced on the crown in such a way as to produce what is called the "many-furrowed" tooth, the "step-like" tooth, etc. All this is at the same time simple and logical. These inductions begin to step beyond the pale of hypothesis. They will soon be recognized, I am convinced, as indisputable facts.

Dental erosion is the result of a morbid influence of a general character. If the cause determining the erosion were purely local, its action would be confined within corresponding limits,—an altered tooth, or a group of neighboring teeth affected in an identical or analogous manner. Suppose, for example, a case of periostitis—a local cause—developing, let us say, in the left half of the lower jaw. Such a lesion could certainly affect the teeth comprised in this left half of the lower jaw and cause a stoppage of formation,—dystrophy of one form or another; but it would limit its action to that point. It could exert no influence whatever on the teeth of the other half of the lower jaw, or upon those of the upper jaw. A local cause is competent to produce only local results. Such a cause is absolutely insufficient to account for the conditions noted in dental erosion, *viz.*: First, multiple and wide-spread changes of the dental system, affecting both jaws; second, symmetrical changes affecting homologous teeth; third, systematic changes, affecting at the same level teeth of the same class and at different heights dissimilar teeth. It is evidently only a general cause which can act as the origin of such lesions. I do not pretend that there are not dental changes derived from other than general causes. There are many which result from causes entirely local, such as bony affections. But these differ absolutely from those which have just occupied our attention, especially in their exclusively local topography.

Dental erosion, therefore, as it shows itself ordinarily,—that is to say, as a collection of multiple lesions, widely spread, symmetrical, systematized, etc.,—cannot be considered as an affection of one or several teeth; it represents an affection of the organic system. It would be inexplicable by the action of an entirely local cause. It is of necessity the product of an influence of a general kind, the character of which we have especial interest in knowing, and which it remains for us to seek out.

There are questions in pathology which constitute true apples of discord, giving rise to opinions most contradictory, and becoming involved in interminable controversies. The one of which we are about to speak is of this number. Let us proceed at once to the facts.

There are three principal opinions as to the etiology of dental erosion. According to some, dental erosion has no relation with syphilis, but

is connected with a special affection of infancy, eclampsia. According to others, it is always and exclusively the result of hereditary syphilitic influence. Finally, according to others still, it is simply an ordinary lesion, but originating from syphilis with a marked frequency, and even appearing to originate from it alone in one of its forms,—the Hutchinson tooth. Let us endeavor to unravel the clinical truth from the midst of this conflict of theories.

The first of these opinions has been upheld by a distinguished physician, an eminent specialist of the dental art, M. Magitot, in his "Treatise on the Anomalies of the Dental System",<sup>1</sup> and developed since then in different publications or in the learned societies<sup>2</sup>. Furthermore, some of his students, Messrs. Castanié,<sup>3</sup> Rattier<sup>4</sup>, and Quinet<sup>5</sup> have adopted and spread the doctrine of their master, sometimes even exaggerating it. M. Magitot has built up and defended his theory in a most scientific manner. In the first place, he has furnished for the support of his conclusions a large collection of facts. In one of his memoirs, for example, he quotes no less than forty observations relative to patients who, affected with dental erosion, "had all presented in their infancy symptoms of eclampsia, without any other malady to which could be attributed the lesion of the dental system." He has also produced in favor of his doctrine divers arguments, some of which have a very high value. Thus, to quote but one, "one could in a number of cases establish a connection strictly exact between the age when the eclampsia occurred and the level of the crown where the erosion took place." He believes this connection to be constant. "Today," he adds, "we do not confine ourselves, in presence of this dental lesion, to an assertion of the previous occurrence of eclampsia; we go further, and, from the level of the notch or the furrow, we name the date of the convulsions," etc. In other words, given a dental erosion, it would be possible from its level on the crown, to establish that a convulsive attack took place at such or such an age,—that is to say, corresponding to such or such a degree of development of the tooth. The eclampsia itself, in some manner, marks upon the dental crown the date of its appearance. It thus seems incontestable that infantile eclampsia can be the cause

<sup>1</sup> Treatise on the Anomalies of the Dental System of Man and the Mammals. Paris, 1877.

<sup>2</sup> Clinical Studies on Erosion of the Teeth considered as a Retrospective Sign of Infantile Convulsions. Paris, 1881.

<sup>3</sup> Of the Erosions or Alterations of the Permanent Teeth following the Diseases of Children. Paris, 1874, Thesis No. 384.

<sup>4</sup> Contribution to the Study of Dental Erosion. Paris, 1879, Thesis No. 569.

<sup>5</sup> Apropos of Syphilitic Teeth. 1879.

of dental erosion. I accept this conclusion, because it appears to be impossible to refute or disregard it. But, this granted, is eclampsia the sole cause of dental erosion? "Yes," reply M. Magitot and his partisans. "No," we reply with no less confidence.

In establishing eclampsia among the etiological antecedents of erosion, M. Magitot has perceived and established an accurate fact, of which we have accepted the authenticity. But, governed doubtless by the idea he followed out, he saw but this fact alone; he has disregarded or wrongly interpreted the cases which did not support his theory or which might have opposed it. He has generalized a particular fact, in giving as an explanation of *all* dental erosions that which is applicable to but a certain number. If we study without pre-conceived ideas on the subject the antecedents of patients affected with dental erosion, we find a considerable number of cases where the theory of eclampsia fails us entirely. If necessary to cite particular examples the only embarrassment would be in making a choice. A single case only I shall borrow from my notes—one which gives place to no error, to no possible suspicion of non-observance or failure of memory in reference to the eclampsia. A young child, on whose account I have been many times consulted, presents absolutely typical dental erosions. This child, an adored son, has always received the most extreme attention to the slightest details of his health. He has been treated from his birth to the present day by my colleague and friend Dr. R. Blache. There has not been one of his most trivial indispositions, for which M. Blache or myself, or sometimes both of us at once, have not been summoned to him. Well, this child, notwithstanding his dental erosions, never had the shadow of a convulsion or anything that could in any way resemble one. This M. Blache recently stated to me; and the father and mother, who have not lost sight of their child for a single day since its birth, confirm this assertion. A single fact like this would serve to explode the exclusive theory which ascribes to eclampsia all the cases of dental erosion. But facts of this kind abound. Therefore, while admitting that eclampsia can act as the origin of dental erosion in a certain number of cases, we claim that it is not the sole cause which may produce it.

I have only to repeat this statement with reference to the theory, no less exclusive, which attributes to syphilis all that the preceding one ascribed to eclampsia.

This doctrine originated in England through the labors of Hutchinson. Among ourselves, it has its chief representative in my eminent colleague Prof. Parrot, who has dedicated to it several of his fine lectures upon hereditary syphilis.\* It can be summed

\* See especially "*Le Progrès Médical*," 1881, p. 359.

up in this manner: hereditary syphilis is the essential, the unique cause of dental erosion. Here still is partly truth and partly error. It is assuredly an incontestable fact that syphilitic heredity is the true origin of dental erosion in numerous cases. It is absolutely certain that, in a number of patients, the erosion cannot be attributed to any other cause. But it does not follow that dental erosion proceeds invariably from syphilitic heredity. In fact it is not uncommon to meet with dental erosions upon non-syphilitic subjects, born of non-syphilitic parents. I recall a fact which, were it the only one, would settle my conviction on this point. One of my most intimate friends, a companion from childhood, whose whole life I know as he knows mine, has a child who presents four teeth affected by erosion. Neither this child, nor his sister, nor his father, nor his mother has ever had the slightest syphilitic symptom. And how many other analogous observations could I not produce!

There is also testimony drawn from an entirely different class of facts. It is generally accepted that syphilis does not affect the ox or the dog, but dental furrows have been observed on the teeth of these and other animals.\* In a four-year-old Durham ox, M. Magitot saw the two central teeth affected with erosions, transverse and deep, occupying the upper third of the crown. In the histological examination a zone of globular dentine was found corresponding to the level of the erosion,—a lesion like in every point to the dental erosion of man. Likewise, M. Capitan recently showed to the Society of Anthropology the jaw of a dog affected with multiple dental erosions. From all this, then, a final conclusion is reached, viz., that syphilis is not the sole origin of dental erosion.

We have thrown aside as inadmissible the two absolute doctrines which attribute the origin of dental erosions exclusively to eclampsia or to syphilis. It remains for me now to expound and defend a third doctrine—or, if the word appears a little ambitious, a third opinion—to which I have been led by my personal experience, no less than by the works of my predecessors. This opinion, which alone seems to harmonize the clinical facts, may be summed up under three heads in the following manner: First, the dental malformations known under the name of erosions are commonplace lesions, susceptible of derivation from diverse and multiple causes; second, syphilis is sometimes and perhaps oftener than any other cause the origin of these conditions; third, from the special point of view which occupies us—that is to say, as symptoms competent to aid in the retrospective diagnosis of hereditary syphilis—

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\* According to M. Rattier (Thesis quoted p. 86) M. Duval "has made a collection of eroded teeth, among which are found the teeth of the horse, the elephant, and the hippopotamus."

dental erosions have a very unequal value, according to the forms which they assume. Some of these forms, resulting with an undeniable frequency from causes foreign to syphilis, have no diagnostic signification; while others, caused almost alone by syphilis, constitute nearly positive signs of specificity. We shall endeavor to justify this triple proposition by as rapid a discussion as possible.

First, dental erosions, we have said, are but commonplace lesions, manifestly derived from multiple and diverse causes. What, then, is dental erosion? It is, very evidently, as acknowledged by all, a lesion of nutrition. We have seen that it results from a temporary interruption in the process of dentification. At a certain stage of its evolution the tooth does not receive the amount of nutritive material necessary for its proper formation. As a consequence, it is viciously and incompletely constituted, at this period; and this arrest of development, this disturbance of nutrition, shows itself on the crown by an atrophic zone which we call erosion. Then, *a priori*, is it possible to admit that syphilis alone has the power of inducing a nutritive disturbance in the dental system? On the contrary, is it not probable that a lesion of this kind, without specific character, may originate from any morbid cause giving rise to a profound disturbance of the general nutrition? *A posteriori*, it follows that dental erosion arises from multiple causes, since we meet with it in divers conditions—that is to say, for example, in patients who have not had syphilis, as in patients free from eclamptic antecedents. It follows that the cases which are explained neither by syphilis nor by eclampsia should be explained by other morbid influences.

Without doubt science is still far from being settled upon the etiology of dental erosions, but numerous causes to which they have been attributed, such as eruptive fevers, pyrexiae, serofula, rickets, etc., are absolutely inadmissible in many cases in which they have been cited; for the reason that the teeth were already definitely formed, and consequently not susceptible of malformation at the time when these causes *could have had any effect*.\* Some carefully observed facts attest, however, in a very definite manner the etiological connection of certain morbid conditions with the erosion. Thus, M. Magidot has related an interesting observation of dental erosions caused by a chronic enteritis. In this case, the incisors, the cuspids, and the first molars were in a state of complete disorganization, as in the form called "honeycomb." There the seat and the extent of these lesions offered a precise connection with the invasion and the long duration of the enteritis, which,

\* This M. Parrot has authoritatively demonstrated (*Le Progrès Médical*, 1881) so that I have nothing to add or to modify.

having begun in the second month, was prolonged to the second year. The second and third molars, the evolution of which, as we know, occurs after the second year, presented no alteration whatever.\* Likewise, M. Pietkiewicz observed the following fact, which he has been kind enough to communicate to me. A young man of nineteen presented himself to him affected with numerous dental erosions. From the seat and the extent of these erosions, our skillful confrère decided that the morbid cause from which they sprung should have occurred at the age of from eighteen months to two years. He looked up this case, and learned that at the age of eighteen months his patient fell from a first story; that he suffered from several wounds in consequence of this fall, and that on account of this he was compelled to remain in bed several months in a most serious condition.† It is useless to further insist on this first point, which is accepted by the great majority of physicians.

Let us consider the second point. The pathogenic relation of dental erosion with syphilis springs from numerous considerations, of which it will suffice to cite the principal ones, viz.: First, frequent verification of previous attacks of syphilis in the parents of patients with dental erosions. We could borrow examples by the hundred from Hutchinson, from M. Parrot, and from others who have occupied themselves with this question, without reference to about one hundred and thirty cases from my personal notes. These observations may be thus summarized: Patient affected with dental erosions; on this account syphilitic heredity suspected; interrogation of the parents, who acknowledge syphilis previous to the birth of their child. Example—a child of a dozen years is sent to me by one of my colleagues, on account of an ulcerative lesion of the velum, which I diagnose to be a gumma. I examine the teeth, and find the erosions of such a nature as to confirm my suspicions. I then question the father of the little patient and learn from him: First, that he had syphilis a short time previous to his marriage, and that he was incompletely treated for it. Second, that he had the misfortune to communicate syphilis to his wife in the early period of his marriage. Third, that the first-born child died of syphilis. Fourth, that his second child (the one I am consulted about) had in his early months divers symptoms which were considered to be syphilitic, and were treated and cured as such, etc. Facts of this kind abound—they are innumerable.

We frequently discover in patients affected with dental erosions either syphilitic antecedents, or actual symptoms of syphilis. Examine a certain number of persons affected with dental erosions,

\* Clinical Studies on the Erosion of the Teeth, p. 6.

† Unpublished observations.

and you will recognize—not upon all, but upon the majority—evidences of syphilitic heredity. You will be duly enlightened as to some of them by an exact clinical history. Among others, you will find the manifest remains of specific symptoms—cutaneous cicatrices, cicatrices of the mucous membranes, corneal opacities, perforation of the velum, nasal flattening, cranial protuberances, lesions of the long bones, etc. Finally, in others, as in the case before mentioned, you will be enlightened at once by the actual existence of undoubted syphilitic lesions. Of this kind, the examples are likewise very numerous. The three following cases, taken at random, will answer as specimens. In an observation of Coupland, a young girl of 13 years, presenting dental malformations and corneal opacities, was attacked with visceral symptoms, to which she succumbed. The autopsy showed, among other lesions, hepatic gummatæ.\* Archambault relates the case of a child born of a syphilitic mother, who was affected, at about the age of three months, with typical secondary symptoms, and later presented an absolutely vicious second dentition—serrated erosions, vertical flutings, etc.; and at 12 years of age, had exostosis of the tibia and of the metatarses.† Cheadle reports a case of dental malformations in a girl of eight years, with other syphilitic manifestations, viz., keratitis, nasal lesions, necrosis of the palate, rupia, facial tubercles, tibial nodes, parietal periostosis, etc.‡ Such facts, joined with many other similar ones which I could cite, are demonstrative.

Polymortality of children takes place in families of persons affected with dental erosions. We know, and it is an important fact, that hereditary syphilis shows itself with the greatest frequency by what we may term “the extermination of the young.” Syphilis kills children as no other disease does: it kills them in utero; it kills them at their birth; it kills them in their first months, or later. If the specific treatment does not correct the disastrous influence of this diathesis, several children of the same family—that is to say, two, three, four, five, six, or more, may pay fatal tribute to the hereditary poison. It is this fatality which we term—so many catastrophies of this kind passing under our eyes—the infantile polymortality of syphilitic families. It is a curious coincidence that this multiple mortality of the young is met with in families where we observe dental erosions. Given a child affected with dental erosions; go back to the family antecedents, and you will generally learn that several brothers or sisters of this child were still-born

\* *Medical Times*, 1880.

† *Union Médicale*, Jan. 21, 1879, p. 93.

‡ *Brit. Med. Jour.*, 1880, p. 204.

or died young. You will often be surprised at the unusual mortality of the children of this family.

In the following observations, all relating to persons affected with dental erosions, the figures refer to the mortality of children in each family. Observation of Pietkiewicz,<sup>1</sup> 3 dead out of 5; Chaboux,<sup>2</sup> 3 dead out of 4; Russell,<sup>3</sup> 3 dead out of 4; Fournier, 3 dead out of 4; Stanley,<sup>4</sup> 4 dead out of 9; Fournier, 4 dead out of 8; Stanley, 4 dead out of 6; Parivaud,<sup>5</sup> 4 dead out of 5; Rivington,<sup>6</sup> 4 dead out of 5; Fournier, 5 dead out of 9; Fournier, 2 dead out of 8; Fournier, 5 dead out of 8; Coupland,<sup>7</sup> 7 dead out of 12; Fournier, 7 dead out of 9; Coupland, 9 dead out of 15; Lancereaux,<sup>8</sup> 9 dead out of 12; Carré,<sup>9</sup> 11 dead out of 12. What a striking parallel! On the one hand polymortality of children in syphilitic families; and on the other polymortality of children in families where dental erosions are met with. Is not this comparison significant? Is this not a positive demonstration?<sup>10</sup>

Thus, to recapitulate—frequent verification of syphilis among the parents of patients affected with dental erosions; frequent verification among the patients themselves of heredo-syphilitic symptoms; polymortality of the young in families where the erosion is observed—here are three facts of the highest importance, which establish very clearly, to my mind, the pathogenic relation of dental erosion with syphilitic heredity.

A question remains to be solved. In what proportion of frequency are dental erosions due to a heredo-syphilitic influence, in

<sup>1</sup> Observation before quoted.

<sup>2</sup> Of Certain Lesions of the Naso-pharyngeal Region which should be attributed to Syphilis. Paris Theses, 1875, No. 430, p. 37.

<sup>3</sup> *British Medical Journal*, 1869, Vol. IV., p. 86.

<sup>4</sup> *Medical Times*, 1861, Vol. II., p. 240.

<sup>5</sup> Thesis of Couzon (Contribution to the Study of Interstitial Keratitis), Paris Theses, 1883, p. 31.

<sup>6</sup> *Medical Times*, 1872, Vol. II., p. 433.

<sup>7</sup> *Medical Times*, 1880.

<sup>8</sup> Op. cit., page 330.

<sup>9</sup> *France Médicale*, 1877, p. 106.

<sup>10</sup> It has been necessary for me to omit, in the argument which has preceded, a number of accessory peculiarities of real interest. The following are some of the most important:

It has been remarked that, in syphilitic families, most frequently it is the eldest child, or the eldest of the surviving children, that presents the erosions characteristic of syphilis, while the younger ones are free from them. This fact has an easy and rational explanation to me, in the habitual and undisputed decrease of the heredo-syphilitic infection under the influence of time and treatment. There are cases, however, where several children of the same syphilitic family are affected with dental erosions. To quote but one example, Moon (*Monthly Review of Dental*

comparison with other causes capable of producing them? Unfortunately, this question is not answerable in the present state of our knowledge. All that we can say of it is that syphilis certainly constitutes a common cause of dental erosions. It seems to me even undeniable that it constitutes the principal cause. Dental erosions of specific origin present themselves by hundreds, while those attributable to other causes are singularly limited in number. Eclampsia would certainly be claimed by M. Magidot and his partisans as having large influence. But here the influence of syphilis would reassert itself, for infantile eclampsia is often but a symptom of hereditary syphilis. Numbers of syphilitic children are afflicted with convulsions; \* many die from them. Then, among these cases of dental erosion attributed in mass to eclampsia there are necessarily a certain proportion which belong in fact and by right to syphilis. However this may be, the question of relative frequency cannot at present be decided, for the materials for reliable statistics on this subject are wanting.

Another point remains for us to consider. Have all dental erosions the same semiological value? Should they all, to the same degree, raise the suspicion of a specific origin? It is certain that syphilis can cause them all, whatever they may be; but it appears none the less evident that it produces certain types of erosion rather than others. On this account those types will have for us a diagnostic value which others would not. Without doubt, in view of the newness of the subject, it would be imprudent to yet specify anything precise or definite in this regard. Nevertheless, we are able

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*Surgery*, translated in *Le Progrès Dentaire*, 1877,) has made a curious observation where, among three children of the same syphilitic family, there were two—one sixteen and the other eleven years old—who had dental erosions. In cases of this kind, where several children of a family are affected with dental erosions, it has been noticed that "these lesions are more marked in the elder one and gradually grow less in the younger ones." (Hutchinson, the *Medical Times*, 1861, Vol. II., p. 624.) It may be that in a syphilitic family where several children are affected with dental erosions, others are exempt from them, without their escape being explained by any other reason than that of the law of diminution, of which we have just spoken. In the case of Moon's, before quoted, we see a child of fourteen years presenting healthy teeth, while his elder and his younger brother (younger by three years) were affected with characteristic erosions.

Are dental erosions of syphilitic origin transmissible by heredity? This point is yet unsettled. An observation by a foreign author, Barraclough (*Medical Times*, 1876, Vol. II., p. 349,) shows us two brothers, "syphilitic," (?), who, affected with dental erosions, had between them six children, all affected with like or analogous erosions. But this case, curious as it may be, does not possess details sufficiently precise to be demonstrative.

\* See *Syphilis and Marriage*.

at present to formulate the few following propositions, as expressing the facts observed up to the present time:

*First.* The punctated, the cup-like, the facet-like, and the saw-like erosions of the free edge have but little or no value as evidences of a heredo-syphilitic influence, because we meet with them frequently outside of all specific heredity.

*Second.* The furrow-like erosion (sulciform erosion of Parrot) is more important, but it is indisputable that we observe it with a certain frequency in cases where syphilitic heredity can be absolutely excluded.\*

*Third.* The atrophy of the dental cusp—notably that affecting the first molar and constituting the short, flat tooth—has a more precise meaning, because this is a favorite form of the malformation when caused by syphilis.

*Fourth.* But the best sign, one which can be given as an almost certain evidence of syphilitic heredity, is the semi-lunar notch of the free border—that which is called the Hutchinson tooth. This special form of erosion—above all when it occupies its chosen seat, viz., the superior central incisors—is a diagnostic element of incontestable value.†

I cannot go so far as Hutchinson and say that this is a pathognomic sign,—that this malformation of the superior central incisors suffices to prove hereditary syphilis. However, I have yet to find a single case where this sign has deceived me; I have yet to find a single case of this dental malformation, “the crescentic notch of the free border,” which has been produced by causes other than those of syphilitic heredity; so that, if I confined myself to the results of my personal observation, I should be very much tempted to affirm the specific nature of this Hutchinson tooth. But I believe that, in a question so new, prudence is necessary, and that it would be prema-

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\* In more than twenty cases I have verified the furrowed tooth in adults who have recently contracted syphilis. A short time ago, for example, I observed erosions of this nature upon a young man of twenty-five years, affected with a hard chancre several weeks old, with roseola, mucous patches, etc. In cases of this kind the following problem is met with: Either the furrowed erosions are exclusively of syphilitic origin—and then hereditary syphilis does not constitute an immunity against later syphilitic contamination; or the furrowed erosions are not of a syphilitic order. The last solution of this problem appears to us preferable in all respects.

† Mr. Hutchinson, with whom I had the honor of conversing upon this question, admits as “specific teeth” only the superior central incisors. According to him, every semi-lunar notch affecting the superior central incisors would be an absolute sign of syphilitic heredity. But this same lesion affecting other teeth, “would no longer have any signification relative to specific heredity.” This statement seems to me unacceptable as regards its second clause. Why attribute a semiological

ture to form absolute conclusions. I will confine myself then to stating the condition of our accurate knowledge on the subject at present, viz., that the semi-lunar notch of Hutchinson is a formal presumption—perhaps even a certain sign—of syphilitic heredity; that no one has yet confronted the semiological value of this dental malformation with a single absolutely authentic contradictory observation; but that, before giving to this valuable sign the term "pathognomonic"—before considering it as of itself furnishing an absolute, irrefutable demonstration of syphilitic heredity—it must yet await the confirmation of a more prolonged experience.

**MICRODONTISM.**—Dental erosion, which has thus occupied our attention at length, is but one lesion among many. It is therefore very improper to make of it the exclusive characteristic of what is termed the syphilitic tooth. In reality the influence of hereditary syphilis shows itself upon the dental system in multiple forms, of which erosion is but one, and of which many other kinds are no less curious or important from the stand-point of retrospective diagnosis.

Microdontism is among the dental malformations which have remained almost unrecognized, owing to the exclusive attention accorded to erosion. It is quite common, however. It is mentioned in a number of observations, and for my part I have frequently met with it in my patients, either as an isolated lesion, or, more commonly, associated with other dental malformations. So that, without attributing to it an accurate or special signification, I have been led to consider it as an important and valuable diagnostic element. Its name defines it. Derived from two well-known Greek words (*mikros*, small, and *odons*, a tooth), it describes the condition of a tooth abnormal through slenderness of proportions—a dental malformation consisting of an unusual smallness of the tooth. The signification to a lesion affecting certain teeth, and deny all value to this same lesion when it affects others. Why is it that which is an absolute evidence of syphilis upon the superior central incisors becomes a dead letter on the superior lateral incisors, or upon the inferior incisors, or upon the cuspids, inasmuch as there are cases where other teeth are affected with semi-lunar notches at the same time, in the same manner, and to the same extent as the superior central incisors? I had lately in my service just such a case, the cast of which I showed to Mr. Hutchinson without succeeding in making him change his opinion. It was the case of a young patient who presents superb semi-lunar notches (Hutchinson type) upon six teeth, viz., the two superior central incisors and the four lower incisors; and all these notches were absolutely identical on these different teeth. Now, if we admit syphilis as the origin in the malformation of the superior central incisors, how is it to be supposed that it had no influence in the concomitant and identical malformation of the other teeth? And, if we attribute a high diagnostic value to the malformations of the superior central incisors, why deny a like signification to the same pathological condition of the neighboring teeth?

tooth thus affected is lessened in all its dimensions—height, breadth, and thickness; it is at the same time short, narrow, and thin—a small tooth, almost rudimentary in certain cases.

Microdontism is never a general condition of the entire denture; at least, I have never met with it under this form. On the contrary, I have always seen it affecting but a few teeth in the midst of an otherwise normally developed denture. Sometimes it is even confined to a single tooth. The teeth affected by it in order of frequency are the superior central incisors, the superior lateral incisors, and the inferior central incisors. In a case of Lannelongue's it affected the four superior incisors. It is found in all degrees, and is often so slight as to be passed unperceived in a superficial examination. Such is the case of a patient we are now treating in our wards for symptoms of hereditary syphilis, and who presents three teeth notably less than normal—two inferior central incisors and one superior lateral incisor, not however, so reduced, that the anomaly would strike an observer at first sight. At other times, on the contrary, microdontism is more marked. It then constitutes a real deformity, which could not be passed unnoticed. Two examples may be given: A young man of eighteen, affected with different manifestations of hereditary syphilis, presents the following curious aspect: Alongside of three superior incisors, normal in form and development, the left lateral incisor was absolutely reduced as regards volume in all proportions; it was ridiculously small, especially as regards length, and presented at the most two-fifths of the physiological size it should have had. In the case of a child, ten years old, the son of syphilitic parents and syphilitic himself, we observed this other more complex anomaly: First, the superior central incisors were strongly notched in crescentic form on their free edge (type of the Hutchinson tooth); rounded off on their angles, and singularly small, short, narrow, and thin, and measuring but half the length of the lateral incisors. Second, the inferior left central incisor presented a very marked transverse furrow about half a millimetre below its free edge, but was normal as regards size. Third, the inferior right central incisor was reduced in all its proportions, and measured only half the height of the corresponding left tooth.

These examples give an idea of this variety of dental malformation, which constitutes a precise clinical sign, easily verified, and equivalent in diagnostic value to that of erosive malformations. But this malformation may be still more marked—there may be such a failure of development that there is no exaggeration in designating it as dental dwarfing. I have before me a specimen of the kind drawn by Hutchinson.\* The two superior incisors do not

\* A Clinical Memoir on Certain Diseases of the Eye and Ear Consequent on Inherited Syphilis. London, 1863. Fig. 7, plate I.

protrude from the gums further than one or two lines. I have observed several analogous cases. In one of them the incisor was so small that it had the appearance not of a tooth, but rather of a small lump of enamel appearing through the gum.

Singular as this mode of action of syphilis on the dental system may appear at first sight, it is nevertheless authentic and duly demonstrated. It has been observed a number of times, and under circumstances which leave no doubt of its pathogenic connection with hereditary syphilis. This is, however, not an isolated fact. Other curious arrests of development take place in hereditary syphilis and terminate now in the atrophy of an organ, such as the uterus or the ovary, now in a kind of general atrophy which we have qualified by the name of infantinism. It is a defective nutrition of the same nature which causes this dwarf tooth. Microdontism is the infantinism of the tooth, and it is derived from a defect of nutrition which clogs the evolution of the dental organ in the same manner as a defect of nutrition of the same origin interferes sometimes with the development of other organs, or even with the development of the entire individual.

**DENTAL AMORPHISM.**—A third form of the heredo-syphilitic influence is constituted by dental amorphism, so termed from "*a*," privative, and *morphe*, form. It is simply the condition of a tooth which, instead of its physiological form, has assumed some other shape. This variety may be placed very nearly in the same class with erosion as to frequency. Here again, as in the preceding variety, it is but a question of partial and non-systematized malformations. In other words, amorphism concerns neither the dental system in a general way, nor any class of teeth in a particular manner; it affects separately one or more teeth, and when it affects several it is far from confining itself to the law of symmetry which is so constant and so remarkable in the erosive malformations.

In a first group figure teeth with simple deviation in shape from the normal type, having lost more or less of the characteristics of the class to which they belong and assumed those of another class. Thus we sometimes observe incisors which, in place of being flattened antero-posteriorly, are thickened, conical, cylindrical, and approach the form peculiar to the cuspids. It is thus, reciprocally, that the cuspids, in place of being cylindrical in body and with conical cusps, become flattened antero-posteriorly, with a horizontal edge. A fine example of the kind is now among my heredo-syphilitic patients. She has a superb set of teeth; but examined anatomically, a singular anomaly is presented, which would probably not have been noticed at first sight. The four cuspids are, as regards form and appearance, like incisors, flattened antero-posteriorly, and in place

of a pointed cusp, terminate in a horizontal edge, like the incisors. They are identical in every respect with the neighboring incisors. Conversely, another patient in our wards, a few months ago, presented two superior lateral incisors literally transformed into cuspids.\* This transformation of type is not generally apt to be so complete. These two are the only cases where I have observed it to such a degree. But we frequently meet with heredo-syphilitic patients whose teeth are modified in type by some partial anomaly—notably by characteristics borrowed from a different class.

A second group comprises divers malformations, changing in many ways the forms of certain teeth, and sometimes ending in true monstrosities. The incisors, for example, present themselves frequently with a free border of abnormal shape. I have seen several times (an example is at present in our wards) the inferior incisors terminate in an oblique edge, as if they had undergone a transverse cutting. At other times we have what are called fluted teeth, that is to say, they are overrun on their crowns by projections,—either transverse or vertical ridges which separate small gutters. At other times we observe on a tooth some accessory tuberosity—a supernumerary tooth. One of our patients had a small molar flanked on its interface with a kind of conoidal apophysis.

Then come the strange and innominate forms. The superior lateral incisors appear sometimes strangely reduced in their transverse diameter—prolonged vertically, and “resembling ivory pegs more than teeth” (Hutchinson). We have seen certain teeth, small, stunted, curtailed, conoidal, assuming the shape of “horns.” Hutchinson has represented in his book† a superior central incisor which, at once notched and transversely widened on its free edge, recalls sufficiently well the appearance of a tricorn (three-horned).

A special form is furnished us by the variety described under the name of the “pegged tooth” of the English writers, who seem to accord it a special interest, to judge merely from the frequency with which we find it mentioned in their observations.

In this form the tooth is notably reduced towards its neck, as if cut in upon its lateral borders at the level of the neck, causing it to appear enlarged at its edge. This form is described by M.

\* This patient, aged thirty years, presented, in addition, the remains of a semi-lunar notch upon her two superior central incisors. One of her sisters, five years older, presented likewise multiple and typical dental malformations. Both were evidently heredo-syphilitics, and owed to their original diathesis different symptoms with which they had been affected in their infancy and youth—(keratitis, iritis, gummata, etc.). See Thesis of Couzon (Contribution to the Study of Interstitial Keratitis in Hereditary and Acquired Syphilis, Paris, 1883) where this observation will be found related in detail.

† Op. cit., Fig. 6, Plate I.

Parrot, in the first dentition, under the names of axe-blade atrophy, axe-like tooth.<sup>1</sup>

Finally, the tooth may be so absolutely changed as to be shapeless. I have seen, for example, in a young man affected with hereditary syphilis an inferior cupid so strange in appearance that it in no way resembled a tooth. It was a sort of bony production, very irregularly cylindroid, yellow, rough, angular, knotty. One would have said it was a pebble, rather than a tooth, planted in the gum. Hutchinson has observed and represented a case of this kind where several teeth were affected with extraordinary malformations.<sup>2</sup> M. Magitot, who has examined Hutchinson's collection, says he found in it several types of these misshapen teeth, "having the appearance of deformed stumps," of truncated cones,—true morphological monstrosities.<sup>3</sup>

Dental amorphism, in the different varieties which it can assume, usually occurs with one or the other of the two classes of malformations previously studied, erosion and microdontism, sometimes with both. This is important to notice, for such a coincidence is significant and well shows that these forms of dental anomaly are connected as regards origin—that is to say, derived from one and the same cause. For example, in one patient we have at the same time—First, typical erosions, notably the crescentic erosion of the superior central incisors; second, very marked lesions of microdontism; third, lesions of amorphism on the cuspids, which resemble incisors.

**VULNERABILITY OF THE DENTAL SYSTEM.**—In a general manner we may say that the tooth affected by syphilis, whatever may be its objective form, is a tooth pathologically constituted, which carries in it the elements of decline, of disorganization. It is essentially a vulnerable tooth—that is to say, predestined to secondary degenerations for the following reasons: First, the syphilitic tooth is generally poorly protected against exterior influences. In the eroded forms, for example, it is not protected at the level of the lesion, or only with a layer of enamel more or less abnormally thin. In the second place, the eroded tooth has not only an imperfect surface, but zones of globular dentine, as we have previously seen, furrow it in its entire thickness. According to M. Magitot, "it is a tooth composed of parts deprived of homogeneity and equilibrium in the relative proportions of their anatomical and chemical elements." Besides, M. Parrot has established that the enamel of this tooth is not only thinned, but furthermore that it is pathologically affected; that it is

<sup>1</sup> *Progrès Médical*, 1881.

<sup>2</sup> Trans. Path. Soc. London, Vol. x., 1859.

<sup>3</sup> Clinical Studies of Dental Erosions, p. 12.

brittle or chalky and only slightly adherent.\* Sometimes also, the syphilitic tooth presents itself "composed of lamellated layers, irregularly superimposed, not adherent or feebly so between themselves, and recalling to mind the stratifications of an oyster shell. This variety was designated by Dr. Delestre, a distinguished dentist, under the name of the "schistous tooth."

Finally, alterations more singular and still undetermined as to their nature are sometimes met with in our patients. M. Magitot recently related to me that he had observed on a heredo-syphilitic patient several teeth strangely affected. He had never seen anything like them previously. "They were," he said, "absolutely greenish teeth—greenish on the surface and throughout; composed of a substance of slight resistance, friable, very extraordinary, unknown to me, but nevertheless eminently pathological."

All these anomalies, all these defects of structure, constitute so many conditions of lessened resistance, of precarious vitality, of easy destruction and premature decay.

The syphilitic tooth is also habitually subject to secondary deteriorations, which change its appearance and lessen its chances of duration. It very frequently presents traumatic lesions—traumatic through progressive wearing, fracture, chipping, crumbling, etc. The dental cusps affected by erosion, thinned, partially or totally deprived of enamel and brittle, do not long resist the wear of mastication, but break, shell off, and are destroyed. It is thus that these small stumps of dentine, which constitute the cusps of certain eroded teeth, crumble, break, and disappear in the course of a few years, leaving a rough surface which the alimentary trituration soon polishes. The semi-lunar notch of Hutchinson is formed in no other way. We have seen that at the commencement the tooth destined to show later this special malformation presents a free edge sown with stalactiform projections, with small conical eminences, with spinules, etc. All this roughness, the remains of the initial process of erosion, disappears in a short time, leaving in its place an empty notch which soon becomes polished from use. Such is likewise the mechanism of "the short tooth"—the type so commonly met with on the first molars. It is but consecutive to the functional attrition of the cusp of the tooth—that is to say, to the breaking down and disappearance of the entire eroded zone. It is not rare to meet with subjects who, still very young, present several of their teeth worn as if they had been filed, having lost a quarter or even a third of their crowns, and terminating in a plane surface, polished and yellow, where the denuded dentine appears. Dr. Chaboux relates the case

\* See also Descamps on Dental Atrophy in Children produced by Hereditary Syphilis. Paris Theses, 1872, No. 305.

of a young girl of thirteen, whose cuspids and first molars were absolutely "worn flat," the crowns having almost entirely disappeared.\*

Syphilitic teeth are frequently affected with caries, and that at a very early age. It is a general law that caries naturally attacks teeth which are imperfectly covered by enamel, commencing at the points least protected, and in consequence most vulnerable. Eroded teeth are exceedingly subject to caries, which frequently invades them at a very early period.† Regarding the first dentition, it is not rare to meet with children who, at the age of four years, have their incisors decayed. We have seen the superior incisors already partially decayed as early as the second or third year. In the second dentition, a large proportion of the teeth affected with erosion undergo speedy decay. At a slightly more advanced age, it is usual to find certain of these teeth in the condition of shapeless stumps. The first molars are the teeth most exposed to these secondary degenerations. They are early invaded by caries and are often destroyed in youth.

There are nevertheless some exceptions to the general rules which we have established. Certain teeth affected by syphilis resist and are preserved for a long time. Let us place in the first rank those which present the variety of erosion designated under the name of the semi-lunar notch. It is common to find even in adult age, Hutchinson's teeth which, despite encroachments more or less profound of their free edge, remain free from caries. We had lately in our wards a woman of fifty-seven years, certainly an heredo-syphilitic, who still had two healthy lower cuspids, with the manifest remains of a notch in their cusps.

We have now considered the most important and most common manifestations that hereditary syphilis shows upon the dental system. I am certainly far from having exhausted the subject, and a number of interesting peculiarities remain for me to notice. First, a white (milky) stain, which under the form of a linear stripe, runs horizontally over the crown of a tooth—not, as in erosion, a loss of substance, a groove cut in the tooth, but simply a white streak, without irregularity of surface. It is purely and simply a dental zone, differing from its neighboring parts by its particular coloring, which is a dead white, chalky, milky, cutting in sharply upon the normal tint of the tooth. Sometimes, however, it presents a more softened tone—is simply opaline. It is absolutely transverse and regularly horizontal, measuring from a half to one millimetre, and running over the whole surface of the crown from one lateral bor-

\* Op. cit., p. 38.

† See Magitot—op. cit.

der to the other. It is a lesion in every respect like that which we call the furrow-like erosion—only it is a streak and not a groove or furrow. Its most frequent seat is the pair of superior central incisors: and, it is a remarkable peculiarity, and significant, that when this white streak affects these two teeth it affects them in an absolutely symmetrical manner, showing itself at the same level of the crown, constituting another analogy with erosion. In a word, the white streak is the counterpart of the dental furrows we have previously studied. We might say that it is a simple variety. Very probably it comes from the same process as that of erosion, with slight secondary differences of anatomical constitution. At any rate we cannot entertain doubts as to its pathogenic relation with hereditary syphilis. I do not pretend—it would be exceeding my experience on this point—that syphilis is the sole cause of its production;\* but I declare that it is the origin of it in a number of cases, and that in a very manifest manner. Since my attention was called to these milky streaks, I have met with many of them upon patients certainly affected with hereditary syphilis, and under conditions where it would be impossible to attribute them to any other cause whatsoever. I have been able to recognize, to ferret out—excuse the term—hereditary syphilis, simply by the verification of such streaks. In proof of this is the following case: A few weeks since a young girl, nineteen years of age, came into our wards with a simple *phtheiriasis*, remarkably spread out and profuse as regards eruption. On examining this patient, I chanced to observe—for her complaint was certainly not of a nature to direct my researches in that direction—two superb milky streaks upon the superior central incisors, symmetrical, and parallel to the free edges of the teeth. Then, curious to go back, if it were possible, to the origin of this anomaly, I began to search. An examination brought to light in our patient antecedents of the most suspicious kind, viz., numerous and prolonged eruptions during early infancy; very persistent and even serious disease of the eyes, judging alone from the duration; disease of the ears, almost complete deafness, lasting more than a year, etc. Then I summoned to the hospital the mother of the patient, and learned from her: First, that her husband had syphilis and was twice married; second, that he had very probably infected his first wife, who, becoming *enceinte* three times, had three miscarriages; third, that she herself had received the disease from him shortly after her marriage; fourth, that in 1867, for example, she

\* We refer here to the true white streak, such as I have just described, and not to those simple white spots which are so common on the teeth in the form of little round or oval marks, circumscribed, placed at random, etc. These latter carry with them no diagnostic signification and are foreign to our subject.

was treated here by M. Bazin, for "mucous patches and copper-colored eruption;" fifth, that three years later she was affected with new symptoms of syphilis in the mouth, etc.; lastly, that, out of six children which she had by her husband, four were dead, three of them almost at birth, etc. In a word, on the one hand we had well-authenticated syphilis in the father and mother of our patient, attested by the most categorical proofs; and on the other hand specific heredity was shown in our patient by the order of antecedents which it is most common to meet with in such a case. This syphilitic heredity was implied by no morbid manifestation for the moment. The "milky streak" of the superior incisors, and nothing else, called my attention to it. Mark what diagnostic service this little sign may render!

Again, it is very common to find among heredo-syphilitics irregularities of implantation, or of reciprocal disposition of divers teeth. Certain teeth leave their alveoli in a faulty direction, and present themselves now as if twisted on their axes, and now obliquely inclined in different ways. This anomaly certainly is but commonplace, and the only curious feature it offers is the frequency with which it occurs in our patients. One of these varieties, however, is a little peculiar. Thus, the superior central incisors affected with semi-lunar notches frequently present themselves with a convergent obliquity which constitutes one of the attributes of those which are called the Hutchinson teeth.

Secondly, syphilitic teeth are sometimes spaced in a very singular manner; that is to say, separated one from the other by large empty spaces. In a number of patients the incisors, especially of the lower jaw, are widely distant from each other, and equally distant from the canines. These distances are not always owing to the fact that the teeth, more or less reduced in volume, leave intervals between them proportionate to their small size. They have their origin much more frequently in a vicious separation of the alveoli; that is to say, in a bony malformation, which I should state has not yet been anatomically studied.

The bones, therefore, have sometimes their part in the creation of these divers dental anomalies. The maxillæ exhibit, also, in some instances, the influence of the diathesis. We frequently meet with diseased maxillæ in children born of syphilitic parents. M. Parrot has established many a time bony lesions of the maxilla in connection with divers malformations of the teeth. He even lays down the principle "that most diseased maxillæ, those most filled with osteophytes, are those which contain the most seriously affected teeth."\* The specimens in his fine collection amply verify the

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\* *Progrès Médical*, 1881.

proposition announced by my learned colleague. Other observers have likewise described lesions of the maxillæ in congenital syphilis. Hutchinson, for instance, has seen in a young child a bony lesion on the alveolar brim cause at first a suppurative swelling of the gum, and then the expulsion of four incisors under process of formation; and, finally, the issue of a large sequestrum, formed of a considerable portion of the dental arch.<sup>1</sup> In another case, related by the same author, the crown of a superior central incisor was thrown out by a suppurative periostitis. It is allowable to attribute to the same influence certain anomalies or arrests of development of the dental arches which we sometimes meet with in the same patients. For example, one of my patients, a young man, affected with divers symptoms of hereditary syphilis, presents at the same time with very well-marked dental malformations a curious disposition of the lower maxilla. The lower teeth, in place of entering within the superior arch when the mouth is closed, overlap and lock on the right half of the superior arch.

Another fact often noticed consists of the malformation of the superior dental arch in the segment corresponding to the incisors and cuspids, so that in the occlusion of the teeth the incisors fail to pass each other, or even sometimes to touch. Moon describes this "defect of vertical development of the superior maxilla" as a peculiarity not uncommonly met with among hereditary syphilitics.<sup>2</sup> Likewise, M. Lannelongue has related an observation of a heredo-syphilitic patient in whom the superior alveolar brim was scarcely developed.

It appears legitimate to attribute to bony lesions other anomalies of a rarer kind, as, for instance, the permanent absence of certain teeth. Sometimes, even,—but this is exceptional,—several teeth default symmetrically. Certain patients present in the lower jaw a large empty space between the permanent incisors and the first molars. This anomaly, according to M. Parrot, is the result of a true atrophic process of the maxilla.<sup>3</sup>

What, then, is the diagnostic signification of these anomalies? They do not constitute pathognomonic signs of hereditary syphilis. Not one of these signs is sufficient in itself to *prove* a syphilitic origin. All these lesions may be met with, independent of syphilis, on patients unsullied by this original stain. That the causes foreign to syphilis concerned in the creation of these diverse lesions are yet unknown, or imperfectly known, there is not the shadow of a doubt. But these causes exist and are active, and the day will come when

<sup>1</sup> Transactions of the Pathological Society of London, 1858, vol. ix.

<sup>2</sup> British Medical Journal, 1879, vol. ii. p. 989.

<sup>3</sup> Op. cit. Progrès Dentaire, 1877.

they will be described. According to all evidence these lesions result from a nutritive trouble, or from an arrest of development. Who will believe that such lesions cannot result except from syphilis as a unique and exclusive cause? But it is not less certain that syphilis is capable of originating such lesions, and that it is a most active cause in producing them. Clinical observation establishes that, given a patient affected with one of the preceding dental malformations, there is a great probability of meeting with hereditary syphilis in his antecedents. They raise the suspicion of a syphilitic heredity, and direct in this sense the investigations of the clinical student. They do not surely, of themselves, prove syphilis, but they should always cause it to be suspected. It is the work of the physician to ascertain by a general examination of the patients, by a minute analysis of the antecedents, if the suspicion born of this special sign is or is not justified by the clinical facts.









